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INVENTORY of POTENTIAL BLACK-FOOTED FERRET HABITAT in the WHITE RIVER RESOURCE AREA, COLORADO

GEBECCA L. GILBERT

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Gebecca L. Gilbert

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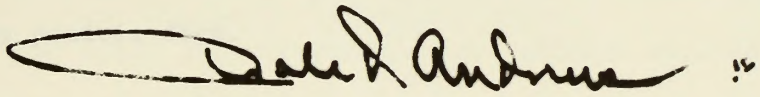
FOREWORD

This publication is the first in a series prepared by Cooperative Education Students working for the Bureau of Land Management in Colorado. The black-footed ferret inventory conducted by Ms. Gebecca Gilbert was a cooperative venture with the Colorado Division of Wildlife. Information obtained provided a valuable input to the Piceance Basin Wildlife Habitat Plan, Colorado's prototype Sikes Act effort.

The Cooperative Education Program for wildlife undergraduate students was initiated with Colorado State University, Fort Collins, in 1975. Ms. Gilbert was one of two such students first brought into the program. Her excellent work presented in this publication reflects the sincerity and dedication to the program of the students, CSU and BLM. Special appreciation is offered to Dr. Douglas Gilbert and Dr. Donald Crews at Colorado University, who made this work and the Cooperative Education Program possible.



DALE R. ANDRUS
State Director

ABSTRACT

A portion of the BLM White River Resource Area, located in northwestern Colorado, was surveyed for white-tailed prairie dogs and black-footed ferrets. Eighty-two prairie dog towns were located. Towns varied in size from 2 to 8,276 acres (1-3351 ha) with a mean of 327 acres (132 ha). Burrow entrance density transects were run in fourteen towns. The mean density of active burrow entrances was 27/acre (68/ha), and the number of active entrances exceeded the inactive entrances in 93 percent of the towns. Sixty-one percent of the towns in the study area were located in regions dominated by saltbush, with 30 percent in regions dominated by sagebrush.

No sign of black-footed ferret activity was observed. However, all prairie dog colonies should be recognized as potential ferret habitat and a thorough survey for ferret sign should be conducted before any alterations in land use practices are implemented on Federal lands inhabited by prairie dogs.

INTRODUCTION

The black-footed ferret (Mustela nigripes) is on both the Federal and Colorado State endangered species lists. The Endangered Species Act of 1973 states that the ecosystems which are essential for the survival of an endangered species must be conserved through habitat acquisition and maintenance (U. S. Department of the Interior, 1974). The results of inventories for the presence of endangered species on public land should be reflected in management decisions. The purpose of this project was to survey public lands administered by the Bureau of Land Management in the White River Resource Area for black-footed ferret presence, and to identify ferret habitat. I gratefully acknowledge R. V. Ward, BLM Wildlife Biologist, for his guidance and interest throughout the study. Lou Vidakovich, Colorado Division of Wildlife, also provided timely assistance.

Ferrets are most often found in association with prairie dogs, which seem to be a preferred food source (Henderson, Springer, and Adrian, 1974). Under section 1.2000 of the Black-Footed Ferret Recovery Team Plan Proposal, all prairie dog towns are assumed to be black-footed ferret habitat (Linder, unpublished data). There are three species of prairie dogs in Colorado, with the white-tailed prairie dog (Cynomys leucurus) found in eight northwestern counties. From March 1976 to July 1976, research efforts were concentrated in the white-tailed prairie dog towns in Moffat and Rio Blanco Counties.

Early records reveal that the historical range of the black-footed ferret coincided with that of the prairie dog. Cahalane, quoted in Torres (1973), listed four acceptable reports of ferrets in Colorado

between 1946 and 1953. The last listing of a ferret in northwestern Colorado was near Meeker, Rio Blanco County, by Warren in 1942, (Lechleitner, 1962). Since then, there have been several reported sightings in the area but no firm evidence has been found, (R. N. Denney, personal communication).

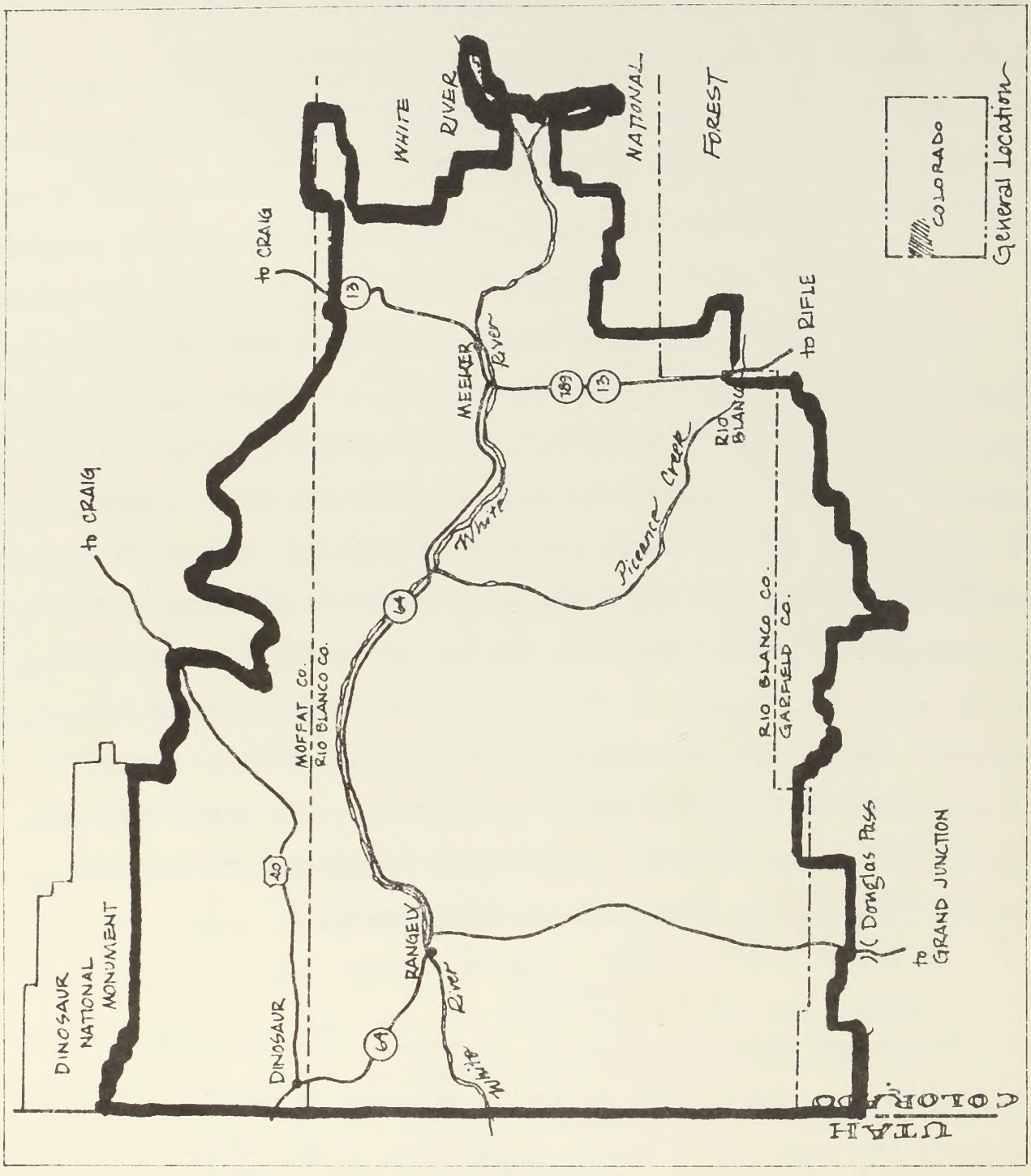
STUDY AREA

The study was conducted in the Bureau of Land Management's White River Resource Area which is located in northwestern Colorado, (Fig. 1). Approximately 97,000 ha. (240,000 acres) in the west central part of the resource area were surveyed for white-tailed prairie dog towns. Annual precipitation in the study area measures about 27 cm (10.5 inches), with the majority occurring as rain during severe summer thunderstorms. Temperature ranges are extreme. Common readings in July and August are in excess of 38 C. (100 F.), dropping to -30 C. (-22 F.) and lower in January and February. Most prairie dog towns are located in open terrain at elevations of between 1585 M. (5200 ft.) and 1829 M. (6000 ft.). The major vegetative cover types at these elevations are greasewood (Sarcobatus vermiculatus), saltbush (Atriplex spp.), and sagebrush (Artemisia spp.).

METHODS

Prairie dog towns were located by referring to Colorado Division of Wildlife maps, BLM multiple-use land planning/Unit Resource Analysis (URA) data, and by driving through likely areas. Towns located in the study area were mapped on USGS topographic quads; scale 1:24,000 and the acreages for each town were figured from these field maps. The field maps were transposed to land ownership maps (scale: 1/2 inch = 1 mile) to determine the land

FIGURE I STUDY AREA



status of the prairie dog towns. Composite maps (scale: 1 inch = 1 mile) of all towns in the study area were overlayed with URA maps of vegetative cover to reveal a possible correlation between this parameter and town locations.

Burrow density transects were run in several towns for an index of prairie dog populations. Transect locations were chosen subjectively in areas felt to be representative of the towns. Each transect was 500 M. long and 5 M. wide, or one-fourth hectare in area. All burrow entrances in the transect were recorded as active or inactive. An inactive entrance was plugged with dirt or covered with cobwebs. Active entrances were classified into three categories:

single entrance, no mound	(Fig. 2)
single entrance with mound	(Fig. 3)
multiple entrance in mound	(Fig. 4)

The number of active entrances per hectare was used to compile a density rating for each transect area. These were arbitrarily classified as follows:

Low = 1-40 active burrows/ha
Moderate = 41-75 active burrows/ha
High = 75+ active burrows/ha

All transect data was collected from 17 May 1976 - 18 June 1976. Transects were not run after 18 June because of bubonic plague outbreaks in prairie dog towns throughout the State.

The areas sampled by a burrow density transect were also checked for trenches and plugged burrows, which often indicate the presence of a ferret. The first two weeks of March were spent surveying snow-covered prairie dog towns for ferret tracks.

Fig. 2 - Single burrow entrance without a mound.

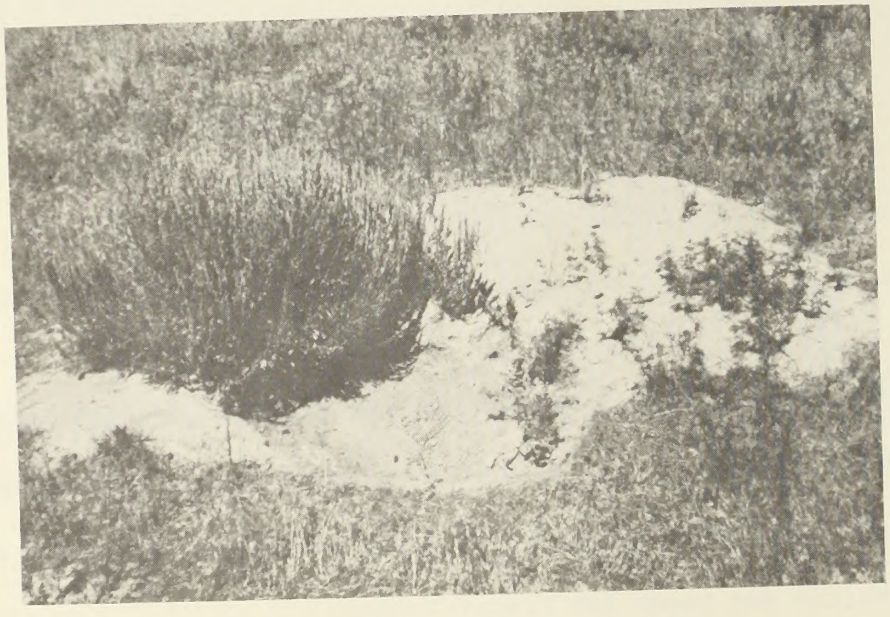


Fig. 3 - Single burrow entrance with a mound.

Fig. 4 - Mound with multiple burrow entrances.

RESULTS AND DISCUSSION

Prairie Dog Town Location and Size

One purpose of this study was to survey the White River Resource Area for black-footed ferrets. However, it was first necessary to locate potential ferret habitat. This proved to be a formidable task, as there was a much larger prairie dog population than anticipated. The results of this study were mostly, then, the locating and mapping of prairie dog towns. While not totally fulfilling the original purpose, this should provide the necessary groundwork for a future ferret study.

There were three ways to locate prairie dogs from the ground: their mounds were seen, the dogs themselves were seen, or they were heard. The winter months provided the best opportunity to locate towns, as the ground was often snow covered and tracks around the mounds made then conspicuous (Fig. 5, 6). During other seasons, prairie dogs were also located by looking for their mounds. These mounds tend to have less vegetative cover than the surrounding areas (Fig. 7), however, white-tailed prairie dogs do not always remove vegetation from their mounds.

Seeing the animals often helped to pinpoint colony locations. Prairie dogs are diurnal and were seen above ground during all months of this study. However, above ground activity was definitely much less in the winter and depended on weather conditions. Patterns of winter activity were easily traced by following trails left in the snow. In the summer it was easiest to locate dogs before midmorning

Fig. 5 - Prairie dog tracks leading to mound. Cottontail rabbit tracks are visible to the left of center.

Fig. 6 - Close-up of white-tailed prairie dog tracks.

Fig. 7 - Clearly visible prairie dog mounds.

while the temperature was still cool. They spent this time feeding and often could be seen sitting upright near their burrows (Fig. 8).

The alarm call of the white-tailed prairie dog is characteristic of the species (Lechleitner, 1969). This was sometimes the first clue to a colony location. The call sounds something like that of a magpie. When searching for a dog town from the road, it was best to drive with the windows down to listen for the animals.

Fig. 8 - White-tailed prairie dog "sentry".

Eighty-two prairie dog towns, covering a total of 26,783 acres (10,843 ha), were identified. The colonies were numbered to facilitate reference. Towns varied in size from 2 to 8,276 acres (1-3351 ha) with a mean of 327 acres (132 ha). Approximately 68 percent of the towns were on Federal lands, with 28 percent on private property and 4 percent on lands administered by the State.

Prairie Dog Population Density

Twenty-one burrow entrance density transects were run in fourteen different towns (Table 1). Type One data is lacking for transects 10-13 because they were run before inactive burrows were included as a burrow type. The mean density of active burrow entrances was 17 per transect, or 27 per acre (68/ha). In all but one transect, the number of active entrances exceeded the inactive entrances, suggesting that the overall prairie dog population is stable or increasing.

Forty-three percent of the transects received a density rating of high and an equal number a rating of low. Colonies in the same geographic region seemed to have similar densities. For example, six out of the first seven transects were in high density colonies, all of which are located north of U. S. Highway 40. The majority of the transects (7 out of 10) that were run south of the White River received a low density rating. This is to be expected as colonies in the same region should be subject to similar environmental pressures.

Burrow entrances without mounds were the most common, accounting for 43 percent of the total number of entrances. Single entrances with a mound and multiple entrances in mounds accounted for 31 percent and 26 percent respectively. The most common entrance type varied considerably between transects.

Past campaigns to extirpate the prairie dog in favor of agriculture and livestock grazing have resulted in a substantial reduction of the population in Colorado (Torres, 1973). However, in 1972, Executive Order 11643 limited the use of toxicants on Federal lands for rodent control to those not having secondary hazards (Berryman and Johnson, 1973).

Table 1. Burrow entrance density in white-tailed prairie dog towns

Town #	Transect #	Location	Burrow Entrance Type* 1	2	3	4	Total (Types 2,3,4)	Density Rating
11	1	T.3N., R103W., S.9, NE¼SW¼	4	14	8	2	24	High
15	2	T.3N., R103W.,S.11, NW¼SW¼	2	11	3	6	20	High
16	3	T.3N., R103W.,S.12, SW¼SW¼	0	18	9	12	39	High
19	4	T.3N., R103W.,S.7, SE¼SE¼	0	9	5	17	31	High
32	5	T.3N., R102W., S.3, SE¼NE¼	0	9	5	18	32	High
34	6	T.3N., R101w., S.6, SW¼SW¼	1	8	5	3	16	Mod.
54	7	T.3N., R101W., S.4, SE¼SE¼	2	7	6	9	22	High
55	8	T.3N., R101W., S.3, NE¼NE¼	4	1	2	0	3	Low
57	9	T.4N., R101W.,S.35, NE¼SE¼	2	4	3	2	9	Low
75	10	T.1N., R103W.,S.15, W½NE¼	-	4	3	0	7	Low
75	11	T.1N., R103W.,S.15, N½SE¼	-	0	21	0	21	High
76	12	T.1N., R103W.,S.15, SE¼NW¼	-	3	8	5	16	Mod.
76	13	T.1N., R103W.,S.15, NE¼SW¼	-	1	o	0	7	Low
77	14	T.1N., R103W.,S.22, SE¼NW¼	0	4	0	0	4	Low
77	15	T.1N., R103W.,S.21, SE¼NW¼	4	6	3	0	9	Low
77	16	T.1N., R103W.,S.28, NE¼NE¼	0	2	4	2	8	Low
77	17	T.1N., R103W.,S.34, NW¼NW¼	0	3	1	0	4	Low
77	18	T.1N., R103W.,S.34, SW¼SW¼	0	3	1	0	4	Low
77	19	T.1S., R103W., S.3, NW¼NW¼	1	13	0	4	17	Mod.
78	20	T.1S., R103W.,S.15, NW¼SE¼	0	16	9	12	37	High
79	21	T.1S., R103W.,S.15, SE¼SE¼	0	16	10	0	26	High

*Burrow Entrance Type Notation:

(1) Inactive

(2) Active, no mound

(3) Active, only entrance/mound

(4) Active, one of several entrances/mound

Since the 1972 Presidential Order, only small scale prairie dog control for health purposes has taken place on Federal lands in Colorado. All control work by the State of Colorado since 1971 has been exclusively on private land. Less than 100 acres (40 ha) of prairie dog towns were treated in the last five years in Moffat and Rio Blanco Counties. The poison used under State supervision was Compound 1080 (G. Terrell, personal communication).

Although relatively few prairie dog colonies are being poisoned on lands administered by the Federal and State governments, many on private property are still the target of eradication programs. Two poisons, 1080 and strychnine oat bait, are registered for use by Colorado landowners. These provide the most economical and effective means of prairie dog control in Colorado (Boddicker, 1975).

Vegetative Cover

The prairie dog colonies in the study area were located in three major vegetative cover types: sagebrush, saltbush, and greasewood. Sixty-one percent of the prairie dog towns were in areas where saltbush is the dominant vegetative cover (Table 3). Shadscale (Atriplex confertifolia) is the most common saltbush in these regions. Slightly less than one-third of the towns were in areas dominated by sagebrush, primarily big sagebrush (Artemisia tridentata). The remaining colonies were in regions of greasewood, pinyon-juniper, Halogeton, or annuals.

Table 3. Vegetative cover composition of prairie dog towns in Rio Blanco and Moffat Counties, Colorado

	Vegetative Cover Type					
	Saltbush	Sagebrush	Greasewood	Pinyon-juniper	Halogeton	Annuals
# Acres	16,380	8,058	1,471	480	247	147
# Hectares	6,632	3,262	596	194	100	60
% Of Total	61	30	5	2	1	1

The preferred food species of the white-tailed prairie dog predicted on the basis of colony location would be saltbush. Sagebrush, the dominant vegetative cover in 30 percent of the colonies, would also be a common food. This agrees with the results of Martin, Zim and Nelson's report on white-tailed prairie dog food habits.

In that study, stomachs of prairie dogs from Wyoming and Montana were examined in each season. One hundred percent of the diet in winter and spring was composed of plant materials, as was 98 percent and 99 percent of the summer and fall diets respectively. The plant species most common in the diet was saltbush. Sagebrush was also found to be a common food in all seasons except summer (Table 4).

Table 4. Composition of the diet of the white-tailed prairie dog.*

Plant Species	% of Diet	Season of Use
Saltbush (leaves)	25-50	SP, Su, F, W
Russianthistle (leaves)	10-25	Sp, Su, F, W
Wheatgrass	5-10	Sp, Su, F, W
Sagebrush (leaves & flowers)	5-10	Sp, F, W
Onion (bulb)	5-10	Su, F
Bluegrass	2-5	Sp, Su, F, W
Pricklypear (fruit & seed)	Trace	F, W
Wheat	Trace	F
Tansymustard, Hawksbeard Blue wildlettuce, Fescuegrass, Bromegrass	Trace	Su, F

*Adapted from Martin (1961).

Ferret Survey

No black-footed ferrets were seen during the study period, however, all field work was conducted during the daytime. Ferrets are primarily nocturnal so the chances of seeing one are greatly improved at night. No spotlighting was done because winter checks with snow ground cover were suggested as a more practical method of ferret survey than night observations with spotlights (R. N. Denney, unpublished data). Winter is one of the best times for observing signs of ferret activity since ferret tracks and digging are most evident in fresh snow. Also, prairie dogs are less active in winter and not as likely to erase signs of ferret digging (Henderson, 1974).

The majority of winter days were spent trying to locate prairie dog towns, as this project did not start until mid-February. However, during winter the towns south of the White River were surveyed intensively for ferret sign. These colonies were given priority because their location

was known prior to commencement of the study. Several days of walking through these prairie dog towns revealed no sign of ferret activity.

Management of Ferret Habitat

White-tailed prairie dogs are able to adapt to many of the changes man imposes on their environment. Houses, powerlines, telephone lines, pipe lines, highways, roads, fences, and stockponds are in or near several of the colonies. For example, town 11 includes the yard of the Dinosaur National Monument Visitor Center. Town 9 is next to a group of tourist cottages. The boundary of colony 73 ends at the parking lot of Northwestern Colorado Community College in Rangely. Colony 81 is next to the Rangely airport. Town 30 is crisscrossed by roads and dotted by oil wells. A major powerline runs parallel to U. S. Highway 40, through towns 15, 20, 46, 42, 32, 56, 58, and 59. An underground pipeline runs through towns 50, 76, and 75. Many towns in the study area are located adjacent to U. S. Highway 40. And, dogs are often found in areas where livestock concentrate, such as around the stockponds in colonies 77 and 59. Because prairie dogs are not particularly sensitive to man's activities, multiple use of public lands poses no great threat to their population. However, land use practices may have to be adjusted to comply with the Endangered Species Act if a black-footed ferret is discovered.

The majority of the colonies are in grazing allotments utilized by sheep in the winter and spring. Sheep and prairie dogs seem to coexist in harmony. It is not uncommon to see them feeding side by side. In the absence of any grazing pressure, prairie dog numbers

decline (Berryman, 1973). This might be because the dogs prefer open terrain without tall vegetation so they can see the surrounding areas, as one of their defenses against predators is visual detection. If prairie dog competition is reducing livestock production by an appreciable amount, control measures may be necessary. When this is the case, control must be in compliance with Executive Order 11643, and control of population numbers does not imply eradication of the colony.

Sport hunting of prairie dogs on public lands is an acceptable practice. It is virtually impossible to control prairie dogs by shooting (Boddicker, 1975) because hunting mortality probably compensates for density dependent factors such as disease and intraspecific competition. Also, since ferrets are nocturnal, there is slight chance of one becoming a target. To some people, the recreational benefit of prairie dog hunting is the only justification for allowing the colonies to exist. In the interest of preserving ferret habitat, it is best to have as much favorable public opinion as possible toward the prairie dog.

As far as management of prairie dogs on public lands in the BLM White River Resource Area is concerned, no major changes are necessary. All prairie dog colonies should be recognized as potential ferret habitat and a thorough survey for ferret sign should be conducted before any alterations in land use practices are implemented in areas inhabited by prairie dogs. If and when a confirmed sighting of a ferret occurs, the area it inhabits must be protected in accordance with the Endangered Species Act of 1973.

CONCLUSION

Perhaps the most important result of this study was that it revealed the extent of the white-tailed prairie dog population in Rio Blanco and Moffat Counties. It was by no means a survey of the area for the black-footed ferret. If this is to be accomplished, it must be the objective of additional research. Suggested research goals are to: (1) Survey the towns in the study area for ferret sign in the winter, (2) Run burrow entrance density transects in all towns, and (3) Continue studies of factors affecting prairie dog colony location.

Included in goal number one is the understanding that if winter daytime checks reveal any possibility of ferret activity, nighttime surveys should be made in that area.

The second goal specifies that burrow density transects should be run in each town for a more representative sample of the total prairie dog population and to indicate the population trends in the area. This data would be useful if ferret introductions are considered in Colorado. Prairie dog colonies with high density ratings should be recognized as possible release sites. Density data would also make it possible to correlate environmental factors such as vegetative cover and soil associations with colony density as well as location.

Goal number three is simply to better understand the environmental requirements of the white-tailed prairie dog. On site soil analysis would lead to an understanding of this environmental factor. And, vegetative composition transects run in the prairie dog colonies would

generate data on a smaller and more accurate scale than the major vegetative types designated on the URA overlay. Data on plant density and subtype species could also be collected.

Continuing research efforts on problems such as those just noted, and the results of this study will hopefully help in the understanding and management of potential black-footed ferret habitat.

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